

REMARKS/ARGUMENTS

Claims 31-48 are presently pending in this application. Claims 24-30 have been canceled. Claims 1-23 have been withdrawn.

The claims were rejected on formal grounds because the language of independent claims 31 and 32 was considered unclear as to whether there is or is not a substrate, and claim 44 was considered unclear as to which carbide layer is being referred to.

Claims 31 and 32 have been revised by reciting that the article has first and second surface regions and that respective first and second surface layers are provided on the surface regions. The claims then continue to define the nature of the surface regions.

It is clear from claims 31 and 32 as previously worded that the layers cannot be there by themselves and necessarily form part of the article which has the first and second surface regions as recited in the claims. As a result, the layers are clearly carried by the article in the terminology of these claims as previously worded.

Nevertheless, to make claims 31 and 32 more easily read, applicants have amended them to recite that the first layer is provided on the first surface region and the second layer on the second surface region, with the remainder of the claim being reworded to reflect this change in wording. These changes to the claims were made for purposes of clarification unrelated to patentability concerns.

Claims 44 and 45 were amended to clarify that each of the alternate layers of carbide has the recited thickness.

In view of the foregoing, applicants request the retraction of the rejection of the claims under Section 112.

All claims were further amended by deleting that the layers are "homogeneous" because this limitation is not considered important for the patentability of the claims. Instead, applicants added depending claim 48 which separately recites that at least one of the layers is homogeneous.

All claims were rejected for anticipation by Burger (DE 198 26 259), which was considered to disclose the claimed invention and to disclose that different coatings may be applied on different parts of the substrate which will yield different coefficients of frictions.

The present invention as defined by independent claims 31 and 32 is directed to an article which has two different surface layers on two separate surface regions of the article. One of the layers has a relatively larger proportion of carbon than the other surface layer. The objective is to attain different coefficients of friction for the two different surface regions. For example, a high coefficient of friction may be provided on a surface region used as a part of a mechanical clutch, while a low coefficient of friction is used on a surface region where sliding is desirable.

Applicants have located the U.S. counterpart for the Burger reference (DE 198 26 259), and it is U.S. patent 6,372,303 (copy attached). For ease of reference, applicants will refer in this discussion to the '303 counterpart to the German Burger reference.

As the abstract of the '303 patent makes clear, it is directed to forming a "wear-resistant and friction-reducing multilayer structure of alternating hard material individual layers and carbon or silicon individual layers" A similar statement is in column 2, lines 31-33. The '303 reference then states (col. 2, lines 40-42):

The multilayer structure has, for example, a greater hardness than the individual layers of which it is made.

In regards to the composition of the layers, the '303 reference teaches that the carbon layer can be made from a variety of carbon-containing materials as described in the paragraph bridging columns 2 and 3 of the reference, and the hard material layer can be made of a variety of materials, including carbides and nitrides, as is set forth in the paragraph bridging columns 3 and 4 of the reference. In regard to the actual selection of materials for the layers, the '303 reference teaches (col. 10, lines 39-44):

Corresponding to the provided application, with regard to the composition it is preferable in this context to combine one type of hard material layer and one type of carbon layer. Each type is

selected from a large number of representatives of the two layer types.

The '303 reference provides no guidance concerning the relative proportion of materials, and in particular it contains no suggestion whatsoever of providing first and second layers on the respective surface regions of the article, with "the first layer having a relatively lower proportion of carbon and the second layer having a relatively higher proportion of carbon in comparison to the first layer", as is recited in claim 31. Claim 32 is similarly limited. For this reason alone, Burger (DE 198 26 259 and the '303 reference) does not anticipate these claims.

The '303 reference also contains no suggestion to provide first and second surface layers on the respective surface regions of the article with "the first layer and the second layer each consisting of a carbide of one or more elements of the group comprising ..., the first layer having a relatively lower proportion of carbon than the second layer in an amount selected to provide the first layer with a relatively high coefficient of friction, the second layer having a relatively higher proportion of carbon in comparison to the first layer in an amount selected to provide the second layer with a relatively low coefficient of friction" as recited in claim 31. Claim 32 is similarly limited. By applying the layers to different (separate) surface regions of the article, the article is provided with surface regions which have different coefficients of friction as may be desired or required by particular installations where, for example, one surface region should slide easily while another surface region should resist sliding by having a higher coefficient of friction.

For this additional reason, Burger does not anticipate claims 31 and 32.

Still further, the '303 reference contains no teaching that different regions of the surface can or should be given different coefficients of friction. The '303 reference discloses a vacuum coating process employing plasma CVD for applying a coating plasma to the substrate. All surfaces of the substrate will necessarily receive the same coat, the same material, and will have the same coefficient of friction. The '303 reference contains no mention, much less any disclosure, to apply different coats or layers to separate surface portions of a given article or substrate. For this further reason, claims 31 and 32 are not anticipated by Burger.

Thus, the '303 reference, and its German counterpart (DE 198 26 259), do not disclose to provide first and second surface regions of an article with respective first and second layers, to provide one of the surface layers with a relatively higher proportion of carbon and the other one with a relatively lower proportion of carbon, and to change the composition of the layers so that the respective surface regions of the article will have different coefficients of friction.

Thus, the '303 reference, and its German counterpart, do not anticipate independent claims 31 and 32. They also do not render the claims obvious, although applicants note that the claims have not been rejected for obviousness.


Dependent claims 33-48 are directed to specific features of the present invention which are independently patentable because they are not disclosed or suggested in the prior art of record, and they are further allowable because they depend from allowable parent claims.

CONCLUSION

In view of the foregoing, this application is in condition for allowance, and a formal notification to that effect at an early date is requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 415-576-0200.

Respectfully submitted,


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